grazing, and to a great extent free of charge, as a special privilege to the forest and other local villagers.

54. The expenditure incurred upon the formation and constitution of Reserved and Protected Forests, during the year, has amounted to Rs, 78,881-6-5 distributed thus :—

	Rs.	a.	p.
(1) Salaries and travelling allowances of Forest Settlement Officers not charged to Forests	30,944	13	3
(2) Salaries and travelling allowances of establishments employed under Forest Settlement Officers and charged in the Forest accounts, and the contingent expenditure of the latter	14,885	6	10
(3) Demarcation of Forest boundaries upon the ground by the construction of special forest boundary marks ...	11,805	7	6
(4) Compensation for land and rights	21,245	10	10
Total ...	78,881	6	5

55. The work actually effected during the year, and represented by the expenditure detailed above, comprises—

(*a*) the settlement of 172 square miles at a cost of Rs. 266·4 per square mile ;

(*b*) the demarcation of 1,453 miles of forest boundary at Rs. 8·1 per mile ; and

(*c*) the purchase of 1,762 acres of land for forest reservation at Rs. 11·8 per acre.

CHAPTER II.

SURVEYS AND WORKING PLANS.

A—SURVEYS.

56. The operations of the Forest Survey Branch of the Government of India, in the Northern Circle during the year, were under the superintendence of Colonel Hutchinson, and were carried on in the divisions of North and South Thána, Násik, Ahmednagar, Poona and Sholápur; and the following statements show a comparison of the work performed and the expenditure incurred on Forest Surveys, during the survey years, ending 30th September 1891 and 30th September 1892, as directed in Government Resolution No. 4515 of the 3rd July 1891, in the Revenue Department :—

Statement showing the Amount and Cost of Work done by No. 2 Camp of No. 17 Party (Bombay Forests) in the Northern Circle during Survey year ending 30th September 1891.

District.	Scale.	Triangulation. Area in square miles.	Triangulation. Total Cost.	Triangulation. Cost per square mile.	Traversing. Area in square miles.	Traversing. Total Cost.	Traversing. Cost per square mile.	Detail. Area in square miles.	Detail. Total Cost.	Detail. Cost per square mile.	General Cost per square mile.	Remarks.
			Rs. a. p.	Rs. a. p.		Rs. a. p.	Rs. a. p.		Rs. a. p.	Rs. a. p.	Rs. a. p.	
Poona {	4″	170	353 15 6	2 1 4	16	368 14 11	23 0 11	124·35	10,852 9 10	87 4 5	112 6 8	Táluka Khed only.
Thána ... {	6″	...	...	...	39	946 1 6	24 4 2	52·86	7,576 0 8	143 5 2	...	Táluka Khed.
	...	...	...	...	45	1,091 9 0		39·70	5,690 14 6		...	Traversing is in advance in the Váda Táluka and the detail survey belongs to the Bhiwndi Táluka.
Poona ...	16″	...	...	...	...	...	...	22	4,255 5 3	...	193 6 9	Haveli, Bhimthadi and Sirur Tálukas.
Total ...	..	...	353 15 6	...	...	2,406 9 5	...	...	28,374 14 3	...	*31,135 7 1	*Is the total cost of the Northern Circle.

Statement showing the Amount and Cost of Work done by No. 17 Party (Bombay Forests) in the Northern Circle during Survey year ending 30th September 1892.

District.	Táluka.	Triangulation.			Traversing.			Topography.						Total.
								8″.			16″.			
		Area.	Cost.	Cost Rate.	Area.	Cost.	Cost Rate.	Area.	Cost.	Cost Rate.	Area.	Cost.	Cost Rate.	
			Rs. a. p.	Rs. a. p.		Rs. a. p.	Rs. a. p.		Rs. a. p.	Rs. a. p.		Rs. a. p.	Rs. a. p.	Rs. a. p.
Poona	Junnar	163	522 15 7	3 3 11	(a) 23	522 15 8	22 11 10	...	.....	...	...	.....	.....	1,045 15 3
	Haveli	75	1,824 15 9	24 5 8	...	.....	...	50·75	7,085 8 4	139 9 10	...	.....	.....	8,910 8 1
	Indápur	...	.....	...	...	.....	...	...	.....	...	15·39	2,111 2 5		2,111 2 5
Ahmednagar	Akola, &c.	220	449 8 0	2 0 8	...	.....	...	...	.....	...	...	.....		449 8 0
North Thána	Váda	...	.....	...	(b) 13	483 4 3	37 2 9	(c) 52·27	8,445 1 10	...	...	.....	137 2 10	8,928 6 1
	Bassein	...	.....	...	...	.....	...	...	.....	161 9 1	...	.....		.....
South Thána	Bhiwndi	...	.....	...	...	.....	...	31·02	5,011 11 9	...	...	.....		5,011 11 9
Sholápur	Karmála and Mádha	...	.....	...	...	.....	...	...	.....	...	(d) 24·43	3,351 4 0	.....	3,351 4 0
	Total	458	2,797 7 4	...	36	1,006 3 11	...	134·04	20,542 5 11	...	39·82	5,462 6 5	.....	29,808 7 7
Cost per square mile		...	6 1 9	...	...	27 15 3	...	...	160 11 6	...	...	137 2 10	.....	.....

(a) 180 linear miles. All in advance. (b) 57 linear miles in Váda in advance. (c) Bassein. (d) Karmála (13·74) and Mádha (10·69).

B.

Statement showing the Amount and Cost of Work done by No. 17 Party (Bombay Forests) in the Northern Circle during Survey year ending 30th September 1892.

District.	Táluka.	Triangulation.		Traversing.		Topography.				Total.	Remarks.
						8″		16″			
		Area.	Cost.	Area.	Cost.	Area.	Cost	Area.	Cost.		
			Rs. a. p.		Rs. a. p.		Rs. a. p.		Rs. a. p.	Rs. a. p.	
Poona	Junnar	163	484 1 8	(a)23	497 0 10	..	....	..	....	981 2 6	(a) 180 linear miles. All in advance.
	Haveli	75	1,747 4 2	..	..	50·75	6,729 15 4	..	....	8,477 3 6	
	Indápur	..	....	..	..	..	....	15·39	2,884 0 6	2,884 0 6	
Ahmednagar	Akola, &c.	220	410 10 3	..	..	..	....	..	....	410 10 3	In advance.
North Thána	Váda and Bassein	..	....	(b)13	457 5 5	(c) 52·27	7,998 15 0	..	....	8,456 4 5	(b) 57 linear miles all in Váda and in advance.
South Thána	Bhiwndi	..	....	..	..	31·02	4,746 12 6	..	....	4,746 12 6	(c) Bassein.
Sholápur	Karmála and Mádha	..	....	..	..	..	....	(d) 24·43	4,578 5 11	4,578 5 11	(d) Karmála (13·74) and Mádha (10·69).
	Total	458	2,642 0 1	36	954 6 3	134·04	19,475 10 10	39·82	7,462 6 5	30,534 7 7	
Cost per square mile		..	5 12 4	..	26 8 2	..	145 4 8	..	187 6 4	....	

Note.—The only difference that has been made in preparing the Form B (distribution of expenditure) from the Statement A (actual expenditure) is the transfer of Rs. 2,000 from "share of pay and travelling allowance" of Deputy Superintendent from the 8″ to the 16″ Survey.

57. Colonel Hutchinson, who was in charge of the Survey Party throughout the year, had Messrs. Lawson, S. F. Norman, and C. A. Norman as his Assistants. The 16″ Bábul Block Survey work in the Poona and Sholápur divisions was taken in hand early in October under the superintendence of Mr. A. M. Lawson, and very satisfactory progress was made till the end of December, an area of 40 square miles having been accomplished.

58. With a view to the execution of a contoured 8-inch survey of the timber-clad hill of Singhar, which is in Reserved Forest, in order to provide an especial map for the education in forestry of the students, attending the Forest Classes at the College of Science at Poona, it was necessary to fix a good many points on the hill, and it was found easier to do this by a minute triangulation than by a traverse; and accordingly the work was taken in hand on the 10th October, under the personal supervision of Colonel Hutchinson, who completed it by the 25th of December 1891, the detail survey of the hill being reserved for the hot season, which subsequently was taken in hand on the 15th of April, and was finished about the 10th of June.

59. The 8-inch work in Bhiwndi and Bassein tálukas of the Thána District was entrusted to the care of Mr. S. F. Norman, who commenced it with six surveyors early in November, and the work was visited and inspected by the Deputy Superintendent in February.

60. The triangulation and traverse work of the teak forests round Jávli-Báleshwar in the Ahmednagar district, and in the Junnar range of the Poona district, was taken in hand early in January after the completion of Singhar triangulation, and was carried on till the 10th of June, by which time 383 square miles were so treated, fixing 553 points in all. An area of 57 square miles was traversed in the Váda táluka of the Thána District, during April and May under Mr. C. Norman's control.

61. Detailed information of the actual expenditure involved upon each description of work will be found in Statement A given above; the resulting mileage rates, however, require a few remarks, especially with reference to the remarks contained in paragraph 4 of Government Resolution No. 7232, dated 12th September 1892, in the Revenue Department, as to the variation of cost rates in different districts for works classed under the same heading, *viz.*, 8-inch or 4-inch work.

62. The mileage rates in the Northern Circle are:—

	Rs.	a.	p.
16-inch work	137	2	10
8-inch work, Thána District	161	9	1
Singhar work Topographical	139	9	10
Triangulation	24	5	8

while those in the Southern Circle are:—

		Rs.	a.	p.
4-inch, Kánara District.	Topographical ...	85	6	9
	Triangulation ...	18	11	10
	Traverse	22	2	8
8-inch, Kolába District		205	7	10

63. In the first place it will be noticed that the 16-inch work is cheaper than the 8-inch work, but this is to be accounted for partly from the absolute flatness of the country surveyed, and the paucity of topographical details met with; and also because that this work has escaped being charged with any superintendence of the Drawing Establishments during the recess; it was done under the immediate supervision of the Deputy Superintendent, whose salary is charged to "General Section."

64. Again it will be noticed that the 8-inch work in the Kolába District is more expensive than that done in the Bhiwndi táluka; the reasons being:—

First.—In the months of November and December when a strong establishment was employed on this work, there was much sickness amongst the sub-surveyors; and consequently a small area was turned out although the expenditure was high.

Secondly.—It will be easily understood that in a Survey Party like the one in question all the sub-surveyors do not work at the same rate, although the slow workers employ the same amount of menial labour, and therefore cost nearly as much as the fast workers.

Thirdly.—The small scattered and broken patches of forests that came under survey in the Kolába District contributed to the increased cost.

65. Again it will be noticed that the Singhar 8-inch work is cheaper than that in either the Kolába or Thána district. This results from the Singhar work being continuous and having been undertaken by the best of the men in the party.

66. As regards the distribution of the total cost of the party between the Northern and the Southern Circles, the Deputy Superintendent states that "the survey requirements do not admit of actual cost rates in different localities being equalized; that this fact should be recognized; and that the rates should be revised accordingly as may appear equitable;" and Statement B given above exhibits the equalized expenditure of the Northern Circle furnished by the Superintendent.

ADVANCE WORK.

67. In the Poona and Ahmednagar Districts 383 square miles of triangulation have been prepared in the Junnar, Akola and Sangamner tálukas, within

which 180 linear miles of traverse work has been done; this is in hilly but fairly open country; and 13 square miles have been traversed in the Váda táluka also.

RECESS MAPPING.

68. Thána District, 19 sections.—Fair drawn on the 8-inch = 1 mile scale for reproduction at Poona.

Poona District, 6 sections.—A contoured map of Singhar hill fort fair drawn on the 8-inch scale for reproduction.

A revised and extended index map for the Northern Circle.

Sholápur District, 53 sections of 16-inch work.—Fair drawn for reproduction.

69. The Superintendent reports that all his Assistants worked in an able and steady manner, and their assistance was most valuable; and the Conservator must remark that Colonel Hutchinson has co-operated most readily with the Forest Officers, and has done his best to meet all the requirements of forest management in the production of forest maps, which evidence very careful and skilful work, and will be of the highest service in the preparation of working plans for placing the forests under methodical management, for the maintenance and improvement of their capabilities, for supplying timber and other forest produce including grass and grazing.

B.—WORKING PLANS.

70. The Working Plans division was in charge of Mr. T. B. Fry, Deputy Conservator of Forests, 2nd grade, throughout the year. The lines on which the work of this division was carried on were the same as explained in former reports, and the following statement will show the progress of such work during the year:—

No.	Range.	Total Area.	Number of Blocks per Range.	Number of Compartments actually laid out in 1891-92.	Average Area of Compartments actually laid out.	Remarks.
	North Thána Division.	Acres.				
1	Máhim	81,843	41	36	42	
2	Bassein	51,230	23	23	51	
3	Sálsette	14,441	10	16	34	
4	Váda	80,568	33	50	59	
5	Dáhánu	107,351	45	56	58	
6	Umbargaon	23,008	12	18	46	
	Total ...	358,441	164	199	52*	Average area of normal compartment is 54 acres.
	Total during 1890-91 ...	358,441	165	105	*54	* Average area of normal compartment.
	South Thána Division.					
1	Kalyán	32,178	16	18	43	† The difference in the total area is due to the transfer of two ranges, Karjat and Khálápur, from South Thána to Kolába Division, and to some extent to the rectification of area against Mokháda.
2	Murbád	71,712	20	20	51	
3	Bhiwndi	46,099	20	21	45	
4	Mokháda	40,190	16	3	56	
5	Khardi	149,366	52	80	53	
6	Sháhápur					
	Total ...	†339,545	124	142	50	Average area of normal compartment is 60 acres.
	Total during 1890-91 ...	393,822	143	109	‡69	‡ Average area of normal compartment.

71. The two forest divisions of Thána have, as heretofore, claimed the attention of the Divisional Forest Officer, Working Plans, to a far greater extent than any other division of the Northern Circle; 442 compartments were thus actually laid out on the ground by the erection of 1,132 cairns and 32,112 stones during the year, covering an area of 17,949 acres at a cost of Rs. 1,566 or Rs. 3½ per compartment, as shown in the statement given below:—